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(54) **Hair treatment composition and process.**

(57) Composition for hair treatment comprising at least two compositions that are kept separate until application which develop an increase of viscosity when mixed while generating heat, wherein one composition (A) contains an essentially anhydrous mixture of a physiologically compatible salt which develops heat when mixed with water, and at least one thickening agent, and a further composition (B) which is kept separate until application contains at least one polyalcohol that is liquid at 25°C and selected from the group of polyethyleneglycol, polypropyleneglycol, glycerol and (or) diglycerol and optionally additional hair conditioning substances. For application composition (B) is first mixed with water and then blended with composition (A), whereby, while generating heat, a viscous gel develops that is applied onto the hair where it provides an enhanced conditioning effect due to improved penetration at higher temperature.

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This invention comprises a composition and a process for the treatment of hair providing an improved conditioning effect compared with conventional compositions.

Hair conditioning compositions have been known since a long time and are still very popular among users, particularly female consumers. They are usually applied after hair cleansing, dyeing or waving processes. Above all it is their task to restore the hair structure, improve lustre and touch thereof, ease combability of wet and dry hair, and provide a lasting hair style.

The number of active substances suggested for this purpose is immense; reference is, e.g., made to the monography of K.Schrader, "Grundlagen und Rezepturen der Kosmetika", 2nd Edition (1989, Hüthig Buchverlag, Heidelberg), pp. 722 to 781.

Known hair conditioning compositions still require improvement, in spite of the multitude of known and suggested formulations, especially with regard to their ability to penetrate into the hair.

It has now been found that an excellent conditioning effect can be achieved if the hair is treated with a composition being obtained by admixture of two components kept separate until application, whereby one composition (A) is essentially anhydrous and contains a physiologically compatible salt that develops heat upon admixture with water, and at least one thickening agent, and a second composition (B) contains at least one polyalcohol which is liquid at 25 °C and selected from the group of polyethyleneglycol, polypropyleneglycol, glycerol and (or) diglycerol, whereby these compositions are, under addition of water, mixed while heat is generated, and the warm gel thus obtained is applied onto human hair and rinsed after processing.

Without sticking to a certain theory, it is believed that the heat treatment essentially increases the penetration of the active ingredients into the hair, which may either the salts developing heat when mixed with water, especially if these salts are bivalent metal chlorides according to a preferred embodiment of the invention, such as calcium chloride, magnesium chloride or zinc chloride, acting as conditioning substances themselves, or the additionally used hair conditioning substances known per se.

As indicated above, the physiologically compatible salt which develops heat when mixed with water is preferably a bivalent metal chloride.

Such bivalent metal chlorides are in particular calcium chloride, magnesium chloride and (or) zinc chloride which also have an additional hair conditioning effect.

Other suitable salts are aluminum chloride, sodium sulfate, sodium carbonate, or beryllium chloride.

The quantity of the metal chloride required to develop heat depends on the desired temperature of the ready-to-use composition, which is about 40 to 60 °C, preferably about 50 °C.

The same applies for the thickening agent present in the anhydrous composition in admixture with the heat developing salt, whereby generally the proportion of salt : thickening agent should be about 1 : 1 to 50 : 1, particularly about 2 to 5 : 1.

Suitable thickening agents in particular are various cellulose derivatives such as methyl cellulose, hydroxyethyl cellulose, hydroxypropyl cellulose, natural gums such as xanthan gum, guar gum or pectin; but also inorganic thickening agents, e.g. aluminium silicate and magnesium aluminium silicates such as montmorillonite or silica may be used.

The essential component of the composition (B) which is kept separate from the composition (A) containing the anhydrous salt, is a polyalcohol being in liquid state at 25 °C, selected from the group of polyethyleneglycol, polypropyleneglycol, glycerol and (or) diglycerol.

The preferred proportion of the heat developing salt when mixed with water in relation to polyalcohol in the ready-to-use mixture is between about 1 : 1 and 1 : 8, especially 1 : 2 and 1 : 6.

A polyethyleneglycol with a molecular weight between about 200 and 600, especially about 400 and about 600, is used as preferred polyalcohol.

The polyalcohol in the ready-to-use composition has a dual function: Firstly it serves as a carrier, and secondly as a thermal reservoir to maintain the heat developed by the mixture of the metal salt with water within the final viscous product for a reasonable time.

This function is best fulfilled by polyethyleneglycol, particularly with a molecular weight between 200 and 600, since it generates additional heat; other suitable polyalcohols such as polypropyleneglycol and glycerol or diglycerol which are preferably used in admixture with polyethyleneglycol do not develop heat in combination with water, but are also suitable to act as a thermal reservoir.

Higher oligoglycerols such as tri-, tetra- and pentaglycerols may be used in admixture with the polyalcohols mentioned above, provided the mixture is liquid at a temperature of 25 °C.

The compositions according to the invention may be applied onto the hair and have there a conditioning effect as already described, in particular when containing bivalent metal chlorides such as calcium chloride, magnesium chloride and (or) zinc chloride (wherefrom calcium chloride is preferred).

It is however expedient and advantageous to use additional hair conditioning substances known per se.

In particular the known long-chain quaternary ammonium compounds or cationic polymers are mentioned as such.

Further film-forming ampholytic, nonionic and (or) anionic polymers may be used for this purpose, too, moreover oils, fats, volatile and non-volatile silicones, humectants, amino acids, panthenol, phytantriol, naphthaline sulfonic acid, etc.

Apart from active agents, auxiliaries may also be used, e.g., anionic, nonionic or amphoteric surfactants, preservatives, etc.

The relevant performance of these compounds and their concentrations of use are known in the art, see, e.g., K.Schrader, I.C., for that reason a specific enumeration thereof is not necessary.

The admixture of these hair conditioning compounds may take place either to composition (A) or to composition (B); if they are present in liquid form or in solution or dispersion, composition (B) will be the more suitable part for admixture.

The composition according to the invention may be applied as follows:

A receptacle, e.g. a vial, comprising the polyalcoholic composition (B), preferably in combination with hair conditioning substances and optionally with surfactants (about 5 to 20g), is filled up with water (about 30 ml), and the solution thus obtained is added to the anhydrous composition (A) comprising an anhydrous salt which generates heat in combination with water, and thickening agents (about 5g in a proportion of about 9 : 1), and mixed. A temperature from about 50 to 55 °C is generated under gel formation. This composition is applied onto wet hair and allowed to act for about 10 minutes, whereby the temperature slowly decreases to about 40 °C. Thereafter the treated hair is rinsed.

The sequence of admixture of the compositions (A) and (B) may also be reversed.

The composition (B) comprising the polyalcohol may contain additionally a water-free alcohol, such as 1,3- or 1,4-butanediol, benzyl alcohol, or benzyloxyethanol, 1-methoxypropanol, or dipropyleneglycol monomethylether to improve penetration.

The proportion of penetration promoter may be between 0 and 25% by weight of the composition (B).

A general formula of the compositions according to the invention is defined about as follows:

Calcium chloride, magnesium chloride and (or) zinc chloride	1 - 70, preferably 1 - 25, most preferred 3 - 15% by wt.;
Polyethyleneglycol (MG 200 - 600)	1 - 60, preferably 1 - 40, most preferred 5 - 30% by wt.;
Thickening agent	0.5 - 15, preferably 1 - 10, most preferred 1.5 - 8% by wt.;
Water	@ 100% by wt.

These percentages refer to the ready-to-use mixture.

The metal salt proportions obviously depend on the fact whether or not they are free from crystal water which are preferred, or crystal water containing salts. In the first case the levels are lower, in the second case higher.

The following examples further illustrate the invention:

Composition No.		1	2	3	4	5	
Comp. A	Calcium chloride (anhydrous)	10%	6%	15%	8%	8%	
	Hydroxymethyl cellulose	2%	2%	3%		2%	
	SiO <sub>2</sub> und Al <sub>2</sub> O <sub>3</sub>				4%		
	Polyethyleneglycol (MC: 200-600)	25%	30%	35%	20%	16%	
	C11-15-Parath 9	1%	1%	2%			
	C <sub>12</sub> -Alkyl glucoside (40-45%) (P.D.I. 4)				2%		
	Pentaerythritol isostearyl glyceryl ether	1%	2%	1%			
	Glycerol		2%	2%			
	Keratin hydrolysate (30%)			2%			
Comp. B	Elastin hydrolysate (15%)				3%	3%	
	Silicone oil (Polydimethylsione)	2%			1%		
	Stearylmonium chloride (40%)	4%		2%			
	Quaternium 80 (50%)		4%				
	Poliquaternium 11 (50%)				7%	8%	
	Isopropyl palmitate		2%	3%			
	Cholesteryl isostearate	2%					
	Jojoba oil					0.4%	
	Ethyl carbitol						8%
	Allantoin/Acetylmethionine				0.2%		
	Lactic acid			0.4%	0.4%		
Water at application		of the product 100	100	100	100	100%	

The hair treated with these compositions presented volume, firm hold but relaxed touch and natural gloss.

# Claims

1. Composition for the treatment of human hair, comprising at least two compositions kept separate until application which lead to an increased viscosity upon admixture in the presence of water while developing heat, wherein one composition (A) contains an essentially anhydrous mixture of a physiologically compatible salt developing heat when mixed with water, and at least one thickening agent, and a further composition (B) kept separate until application contains at least one polyalcohol being liquid at 25 °C selected from the group polyethyleneglycol, polypropyleneglycol, glycerol and (or) diglycerol.
2. Composition according to claim 1, characterized in that it contains a physiologically compatible bivalent metal chloride which develops heat when mixed with water.
3. Composition according to claim 2, characterized in that it contains calcium chloride, magnesium chloride and (or) zinc chloride as a bivalent metal chloride.
4. Composition according to one of the preceding claims, characterized in that composition (B) contains a polyethyleneglycol having a molecular weight between 200 and 600.
5. Composition according to claim 4, characterized in that composition (B) contains a polyethyleneglycol having a molecular weight from 400 to 600.
6. Composition according to one of the preceding claims, characterized in that it contains as thickening agent a cellulose derivative and (or) a natural gum derivative.
7. Composition according to one of claims 1 to 5, characterized in that it contains as thickening agent silica and (or) a aluminium silicate.
8. Composition according to claim 6, characterized in that it contains as thickening agent xanthan gum and (or) guar gum.
9. Composition according to one of the preceding claims, characterized in that in the final mixture to be applied onto the hair the proportion of physiologically compatible salt developing heat when mixed with water to the liquid polyalcohol is between 1 : 1 and 1 : 8.
10. Composition according to claim 9, characterized in that the weight proportion of the salt developing heat when mixed with water to the liquid polyalcohol is between 1 : 2 to 1 : 6.
11. Composition according to one of the preceding claims, characterized in that it contains additionally at least one hair care agent.
12. Composition according to claim 11, characterized in that it contains a film-forming agent.
13. Composition according to claim 11, characterized in that it contains a hair conditioning substance.
14. Composition according to claim 11, characterized in that it contains natural and synthetic fats and oils.
15. Composition according to one of the preceding claims, characterized in that the polyalcohol containing composition (B) comprises a penetration promoter.
16. Composition according to claim 15, characterized in that it contains 1,3-butanediol, 1,4-butanediol, benzyl alcohol and (or) benzyloxyethanol as penetration promoter.
17. Process for the treatment of hair, characterized in that an essentially anhydrous composition (A) containing a physiologically compatible salt which develops heat upon admixture with water and at least one thickening agent is mixed with water and with a composition (B) containing at least one polyalcohol which is liquid at 25 °C and selected from the group polyethyleneglycol, polypropyleneglycol and di-, tri- or polyglycerol according to claims 1 to 16, generating heat under viscosity increase, whereafter the

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gel developed thereby is applied onto human hair and rinsed after processing.

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## EUROPEAN SEARCH REPORT

Application Number

EP 93 11 3101

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
Y	DE-A-2 317 140 (WELLA AG) ---	1-6, 17	A61K7/06
Y	EP-A-0 027 730 (JOHNSON COMPANY LIMITED) ---	4-5, 17	
Y	PATENT ABSTRACTS OF JAPAN vol. 6, no. 186 (C-126)(1064) 22 September 1982 & JP-A-57 099 514 (JIYONSON K.K.) 21 June 1982 * abstract *	1-3, 6	
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A	PATENT ABSTRACTS OF JAPAN vol. 11, no. 206 (C-433)(2653) 3 July 1987 & JP-A-62 030 704 (KOBAYASHI KOOC K.K.) 9 February 1987 * abstract *	1, 7	
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A	US-A-3 723 324 (V. J. PIERCE) * abstract * * column 3, line 43 - line 55; example 1 *	1-17	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			A61K
The present search report has been drawn up for all claims			
Place of search BERLIN		Date of completion of the search 21 OCTOBER 1993	Examiner SIATOU E.
<b>CATEGORY OF CITED DOCUMENTS</b>			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			
T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ..... & : member of the same patent family, corresponding document			

